Flightfax

Aviation Life Support Equipment

How important is ALSE?

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

U.S. ARMY SAFETY CENTER

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POV FATALITIES through 31 March

FY02	FY01	3-yr Avg
54	41	53

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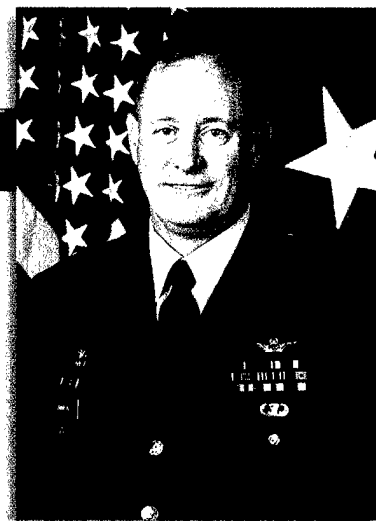
DASAF's CORNER

from the Director of Army Safety

Combined Arms Training

We must always prepare for the next fight—not the last fight. The Army wins wars by conducting successful campaigns, which are made up of successful battles and engagements. Engagements have always been the key to battlefield successes. Engagements are where the combined arms of the Army come together.

Our training must focus on employing all of the combined arms assets in a live-fire environment. Infantry and Armor captains must understand how to safely employ their own direct-fire weapon systems, their own crew-served weapon systems, their organic and indirect fire systems and how to employ supporting artillery, attack helicopter, and close air support assets.

Likewise, our aviation captains must understand how the Infantry and Armor formations at battalion and brigade fight, as well as integrating their fires into the close fight at the company and platoon level. Our aviators must understand what they are seeing as they maneuver about the battlefield, from both the friendly and enemy sides.

We have already had too many fratricide incidents in the current war. While these have not involved the AH-64, the potential exists for us to have fratricide in the close fight as we did in Desert Shield/Desert Storm. Structured field training is the best way to mitigate the risks. Senior leaders, battalion and above, must be in the field observing and controlling the actions of their units and, most importantly, provide resources to include time to retrain to standard.

For too long, many of our attack units have focused on the deep fight. Except for selected units, we have lost the skills necessary to integrate the critical fires of the AH-64 into the close fight. As we have already seen in Afghanistan, we are going to be employed in a close fight role. We must get busy training for that mission if we are going to be successful at killing the enemy and avoid inflicting casualties on our friendly forces.

Communications and TTP are critical in the employment of all of the combined assets. You would not play a football game on Saturday without practicing all week on the plays you plan to use. We should not enter into the fight without having worked out our critical procedures on the training field.

Train Hard

—BG Simmons
Director of Army Safety

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Aviation Life Support Equipment

How important is ALSE?

The US Army Aviation Command's neglect of ALSE sets the stage for equipment failure and increased levels of injury in the event of an unplanned incident. Equipment failures or inadequate training could reduce chances for survival and rescue.

Several recent accidents investigated by the US Army Safety Center (USASC) have highlighted some disturbing issues about Aviation Life Support Equipment (ALSE) at the unit level. Invariably there is least one finding addressing the operation or maintenance of ALSE. While the most recurring issues involve crewmembers flying with ALSE that is overdue inspection, others involve injured crewmembers unable to access/use the equipment in their survival vests, or those who were unfamiliar with the location of the components within the vest, or those not trained in the proper use of the equipment.
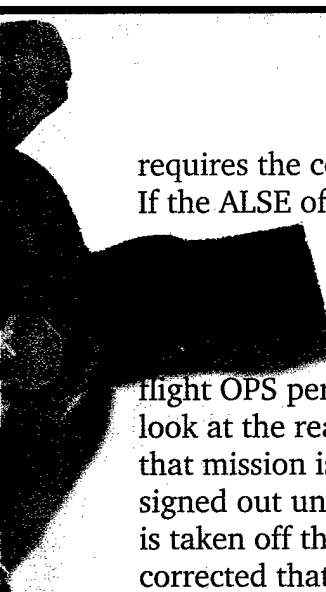
Overdue Inspections.

The most frequent ALSE finding is that one or more crewmembers are performing aviation duties with helmets and/or survival vests that are overdue inspection. The typical aviator is very diligent about preflighting an aircraft and not accepting an aircraft that has overflown

So why does the aviation community routinely tolerate our crewmembers using ALSE that is past its inspection date?

ALSE inspections are not arbitrary. They are mandated by the Department of the Army. They are regulatory just as aircraft and airframe component inspections are. What if there is an accident or you are put in a position in combat where your ALSE is needed? Neither the individual crewmember nor the aviation commander has the authority to arbitrarily ignore ALSE inspections.

While it is an individual responsibility to ensure that your individual ALSE is current, there are methods that the unit ALSE Officer/technician can use to ensure that crewmembers do not overfly inspections. It has been my observation that simply sending a memo to the commander or ASO will not ensure that crewmembers turn in their gear for inspection. It is not that uncommon for the Commander himself to be in violation of ALSE inspection requirements. Commanders can make it known they will not tolerate crewmembers using equipment that is overdue inspection.

Another method that seems to work well for many units involves the reading file and

requires the cooperation of flight operations. If the ALSE officer/technician makes a crewmember "red" for an overdue inspection, when the PC/PI turns in the mission brief sheet and signs for the aircraft ignition key, flight OPS personnel must then take the time to look at the reading file. If any crewmember on that mission is "red", then the aircraft key isn't signed out unless either the "red" crewmember is taken off the flight, or the situation is corrected that made the crewmember "red" in the first place.

Standardization of vest components location.

Should vests be loaded differently for combat versus peacetime? I think not. We should train as we fight. I believe that holds true for survival vests also. That doesn't mean that an AH-64 unit will configure their vests the same as an OH-58D unit. Vests, however, should be standardized within organizations. Should one crewmember need to get an item from an injured crewmember's vest, he needs to be able to find what he is looking for.

Familiarity with ALSE components.

A crewmember must be familiar with the contents, location and operation of the various components of their survival vest. Commanders must make it clear that it is OK for crewmembers to open their vests and use the components, if needed, in peacetime.

There is a perception in the aviation community that our survival vests are off limits and should not be opened or used. Crewmembers who can recite from memory vast and minute details about their aircraft are at a loss to describe the various components of equipment and their location in the survival vests. ALSOs and ALSE technicians should take the initiative and conduct opportunity training during monthly aviator classes or periodic Safety stand down days. Commanders should program into their ALSE budgets a few extra components to be used in periodic demonstrations (for example, the pen flares and combination smoke/flare found in the new

AIRSAVE vest). Commanders must support their ALSOs and ALSE technicians in educating the unit about the importance of ALSE.

Vest component packaging.

The final ALSE trend noted by USASC investigators is the barrier packaging of individual components within the various survival vests. Whether your unit uses the AIRSAVE, SARVIP or SRU–21, the components located in the various compartments must be configured so that an injured crewmember can reach, open and use them. Increasingly, units are using vacuum sealers to shrink wrap the components of the vest. While PM ACIS supports the use of shrink-wrap, a recent message emphasizes that corners of shrink-wrap be notched to permit easy opening by an injured crewmember. The benefits of shrink-wrap are clear: reduced bulk and volume, water and dustproofing, and it makes accountability of the components by ALSE personnel easier.

The drawback is that the thickness of the material being used may make it extremely difficult to tear open the package if you are injured, even if properly notched. I propose that a simple test by our aviation commanders, ALSOs and ALSE technicians be conducted to determine the availability of your units' vest components to an injured crewmember who can only use one hand due to injury or by being pinned in the wreckage. On your 120-day and special inspection, when you are required to open the packages to inspect the contents, try to open the package one handed and/or by using your teeth. Can you do it? If not, it may be time to reconsider your packaging methods; use zip lock bags, or go to a thinner material for shrink-wrapping. As you conduct this test, ask yourself these questions: How important is ALSE to my organization and how much value do I put in the prevention/reduction in the severity of injuries to the personnel in my organization? *Command emphasis* is the key to a sound ALSS program in your unit. ⭐

—MAJ David E. Schoolcraft and SFC Dawayne D. Piper, US Army Safety Center Aviation Accident Investigation and System Safety Division, DSN 558-9858, (334) 255-9858, david.schoolcraft@safetycenter.army.mil

The effects of the Communication Ear Plug (CEP) on crew coordination

Currently, Army Aviation faces a number of challenges with balancing the need for equipment with limited resources. One particular problem of note exists in aviation cockpits. Several aircrew members, especially in the UH-60 community, are unable to hear members of their crew, due to the use of the Communication Ear Plug (CEP). It appears that when one or more of the aircrew members, but not all, wears the CEP during flight, it is difficult for those who are not equipped with the CEP to hear his or her fellow aircrew members. Therefore, the partial fielding of the CEP significantly degrades aircrew coordination and the overall effectiveness of the U.S. Army Aircrew.

The CEP is designed to enhance hearing attenuation while providing increased hearing protection for Army Aviators. To prevent hearing loss and improve hearing conservation, most aircrew members wear additional hearing protection in the form of foam or flanged fitted earplugs. While this solves the problem of eliminating most harmful ambient noise levels, it creates the additional problem of degrading speech interpretation. The CEP was developed by the U.S. Army Aeromedical Research Laboratory (USAARL) as a low cost, highly effective method of additional hearing protection, while enhancing voice communications and speech intelligibility.

Several aviation units are currently issuing the CEP to aircrew members, and in some cases issuing the HGU-56/P with the CEP already installed. However, not all aircrew members in Army aviation, both Active and Reserve have been fielded with this valuable piece of equipment. In fact, several aircrew members purchase the CEP locally with personal funds.

The Army purchased 7,400 CEP sets to be fielded in early 2002. This is good news. However, it appears that not all aircrew members will get the CEP in a timely manner, especially in National Guard and Reserve units. Because of this, it is important that the Army and its commanders recognize and address the negative effects of not having all aircrew members equipped with the CEP, and most importantly, how that potential decrease in crew coordination effectiveness can impact the safety of the aircrew.

A significant number of Army Aviation accidents are a result of crew coordination errors. Most crew coordination errors are avoided through crew-level training. However, some crew coordination errors are due to a series of errors resulting from either equipment failure, adverse environmental effects or misinterpretation by one or more crewmembers. *Communicate positively* is the first and most important element in successful crew coordination. Without positive, concise communications between aircrew members, all elements of crew coordination are significantly degraded, and can place the aircrew in jeopardy.

If aircrew members are unable to clearly hear their fellow crewmembers, or external radio transmissions, the ability to communicate positively is severely reduced. Aircrew members have to fix, adjust or adapt to the problem at their level. This creates increased pilot or crewmember workload
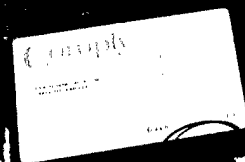
throughout the mission. The problem can be separated into two categories. One is the effect the CEP has on the ability to hear radio transmissions. The second is the effect the CEP has on the ability to hear fellow crewmembers. For example, in the UH-60 airframe, the first problem usually exists when one of the crewmembers is wearing the CEP and the rest of the crew is not. Because of the effectiveness of the CEP transducer, the person wearing the CEP can hear the FM, UHF, and VHF radios well and tends to turn down the volume on the radio control head. This reduced volume causes the other crewmembers to have difficulty hearing radio transmissions being sent to the aircraft. They can react to this problem in a number of ways. The crewmembers without the CEP can turn their Internal Communications System (ICS) volume down, take out additional hearing protection, ask another crewmember to repeat the radio transmission, or do nothing at all and inevitably lose situational awareness. All of these actions severely interfere with positive crew cockpit communications and crew coordination, which increases pilot/crewmember workload.

The second problem occurs when the crewmember wearing the CEP speaks. Studies have shown that there is an effect of wearing hearing protection on both the listener and the speaker. Assume that crewmembers not wearing the CEP are forced to turn their individual ICS box volume up, or remove, either partially or fully, their earplugs in order to hear the external radio transmissions. Because the external radios are now louder to the non-CEP equipped crewmember, they are exposed to significantly great ambient noise, which equates to nearly the same decibel (dB) level as not wearing any hearing protection at all. Interestingly, in a noisy or heavy task loaded environment, individuals wearing hearing protection tend to speak 2 to 4 dB more softly and 25 percent faster. Therefore, the inability to hear the person with the CEP is doubled. This creates a nearly insurmountable environment for crewmembers without the CEP to try to hear their softer speaking fellow crewmember over louder radios or additional external noise.

Due to limited resources, the Army is currently unable to provide CEPs to 100% of its aircrew members. The Army may eventually be able to provide Aviation units with this highly effective piece of equipment, but until then, unit commanders are faced with a tough decision: "Do they allow aircrews with mixed hearing protection capabilities to fly with one another, risking degraded crew coordination, increasing aircrew workload, and inherently increasing the overall risk of the flight? Or do they restrict the use of CEPs until all members of the aircrew possess this piece of equipment?

When it comes to providing resources to today's Army, a lot of analysis must occur and tough decisions are made. The fact is that those decisions almost always directly affect the individual soldier, or in this particular case the aircrew member. Increased technology, contrasted against a lack of resources causes the soldier to react to, rather than gain benefit from a piece of equipment that was designed to improve communications. Because of this, Army leaders must either train the soldier, or establish restrictions in order to protect the soldier from harm. Today's Army aviators and aircrew members must identify that there is a potential risk with using the CEP with less than fully equipped aircrews. Today's Army Aviation leaders must be able to recognize this CEP issue, and consequently establish control measures that will reduce the risk to the aircrew. It would be extremely unfortunate if an accident occurred because we failed to properly outfit our personnel.

—CPT Heather Hennessy, Aviation Captain's Career Course, Class 02-01

ALSE vest check

You are a crewmember in a Black Hawk that just crashed in a confined area, at night, in blowing snow with temperatures hovering at 19 degrees Fahrenheit. You manage to successfully egress the aircraft and realize that except for your other crew members, you are all alone. You are in shock, cold, fingers numb, and you need to contact your sister ship which is 10 miles away. You try your AN/PRC 112 survival radio, but no response. You remain calm, and decide to send up a few warning flares from your survival vest. You reach around to your right in the SRU-21-P vest to get your flares and flare gun. The problem is, you can't manage to get the Velcro pocket open because you cannot reach it to pull it apart. This is not good—no flares and a long wait until someone realizes you are missing and sends out search and rescue.

This sounds like a tall tale but it really took place in a secluded area in Wyoming. Fortunately, there was a happy ending. The crew was rescued by another UH-60 crew in the area who heard the distress call, and knew the area well enough to find their downed wingmen.

Could have been worse

It might have been a lot worse. The pocket that holds the flares on the SRU-21-P is placed too far in the right rear for quick access. It is almost impossible to reach this pocket without taking the vest off. In the dark, in the snow, it may not be a good idea to remove your vest. You probably don't want to risk losing any other items in it.

What can be done to correct this? PEO Soldier Systems can expedite the fielding of the new CWU-33/P22P-18 Vest, but that will take some time. In the meantime, ALSE personnel should inform aviation crews of this potential problem. Individual Crewmembers should inspect and review all items in the vest prior to a flight and have a plan to retrieve those items, if and when they should be needed.

That's what the alse gear is for

All too often, we operate under the premise that the ALSE gear is not to be touched unless it's a "real emergency", so to prevent loss or theft, our ALSE Techs have devised new and inventive ways to package much needed items, to ease them in their inventory and maintenance, not necessarily to be user friendly for the crewmember to access. Having the most likely required items readily available, in easy open packages, zip-lock bags vs. shrink-wrap, might be the difference between minor or severe injury.

As a former Battalion Commander, I assure you that there isn't one thing in that vest that can't be replaced. If you're in the field or deployed downrange and cut your finger, use a band-aid... get a headache...take some aspirin...that's what the ALSE items are there for. The only caveat here is that once you return to home station, it is now your responsibility to take your vest back to the ALSE shop to have the used items replaced. Remember, it's Your Vest, learn it...know it...care for it...it just might save your life! ➤

Fly Safe!

-LTC Keith Cianfrani, USAR Liaison Officer USASC, DSN 558-1188, (334) 255-1188, keith.cianfrani@safetycenter.army.mil
-LTC Scott G. Cliuffo, Deputy Director of Operations, USASC

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Aircraft-Ground

■ Civilian employee was performing OH-58 maintenance during engine run-up when his hair became entangled in the tail rotor driveshaft. Employee sustained extensive head injuries including severed hair and skin layers.

AH-64

Class C
D model
■ Following HIT check, Pilot attempted to take off with one of the two engines at idle.

AH-6

Class C
J model
■ While at a hover in preparation for a Pre-100 hour inspection test flight, the MP noticed a drop in indicated torque and engine oil pressure. Aircraft was landed and MP conducted emergency shutdown. Oil was observed on the parking pad following aircraft shutdown.

M model
■ During autorotational landing assessment on an experimental flight test, the main rotor blade struck the SATCOM and GPS antenna at touchdown. Three of the six blades were damaged, as well as the SATCOM antenna and tail skid

CH-47

Class C
D model
■ Aircraft was landed following low reading on hydraulic fluid indicator. Postflight inspection revealed hydraulic line contact with No. 9 drive shaft and hole in hydraulic line. Scouring damage to No. 9 drive shaft.

■ Crew executed emergency landing following severe vibration. Postflight inspection confirmed separation of aft rotor damper from the blade, subsequent blade contact with, and damage to, the fuselage.

MH-6

Class C
J model
■ During cruise flight, chalk one in flight of three made a precautionary landing due to smoke in the vicinity of the engine compartment. Postflight inspection revealed evidence of fire in the engine compartment.

OH-58

Class B
D-I model
■ During refresher training, while conducting a simulated engine failure, SP noticed aircraft's rotor RPM reaching a critical point and initiated a power recovery. Overtorque of mast and engine. Damage to tail rotor, three main rotor blades and the four upper droop stops.

Class C
C model
■ During start sequence, aircraft's TOT reached overtemp condition. During the Start abort procedure, crewmember's finger slipped off idle detent, preventing him from rolling off the throttle. TOT reached 1000 degrees. Engine replaced.

D-R Model
■ During landing aircraft's transmission experienced 120% overtorque for four seconds. Transmission replaced.

UH-60

Class A
A model
■ During approach to confined area in white-out condition, aircraft drifted AFT and struck a tree. Minor injuries to two crewmembers. Aircraft destroyed.

Class C
A model
■ Following mission conducting hoist operations in a confined area surrounded by trees, postflight inspection revealed damage to two of aircraft's tail rotor paddles.

■ Postflight inspection revealed damage to SATCOM antenna and intermediate gearbox cover, as well as minor damage to four main rotor blades.

K model
■ During MOC for engine replacement, engine oversped to 120%. Engine was shutdown without further incident.

L model
■ Crew noted a loud report (pop) and vibration from aircraft upon completion of a roll-on landing to a field site. Postflight inspection revealed that the tail wheel strut had separated from the mounting point and contacted and damaged the tail rotor drive shaft.

ALSE User's conference

Commanders, ALSE Officers, and other interested personnel are invited to mark your calendars for August 20-22 and make plans to attend the 2002 Army ALSE User's conference in Huntsville. A block of rooms has been set aside at the Huntsville Hilton at the per diem rate of $70.

Anyone interested in making a presentation to this meeting should contact the Program Manager, Aircrew Integrated Systems, no later than 1 June.

PM ACIS Points of contact are: Melanie BARKSDALE, (256) 313-4255, E-MAIL: MELANIE.BARKSDALE@PEOAVN.REDSTONE.ARMY.MIL; OR John Jolly, (256)313-4262, E-MAIL: JOHN.JOLLY@PEOAVN.REDSTONE.ARMY.MIL

Risk management and flight risk assessment worksheets

Sometimes there is confusion over the proper procedures for implementing risk management with respect to flight operations. When we complete a unit-generated, flight risk assessment worksheet, and have it signed by the appropriate approval authority have we accomplished risk management? Not always.

When should we use unit worksheets, the risk assessment matrix, or risk assessment codes in determining the level of risk for a particular operation? These questions can be simplified by reviewing the risk assessment process and evaluating the operations we are attempting to risk manage.

Risk assessment encompasses the first two steps of the risk management process (identify and assess hazards). Hazards exist due to the interaction of man, machine, and environment, and may be related to operations or conditions. The process of assessing hazards is often subjective, but is usually based on a comparison of probability and severity.

The tools to use for assessing hazards are not dictated in any regulation. However, recommendations do exist. For assessing hazards associated with base operations activities, the risk assessment codes discussed in AR 385-10 are most appropriate. This process provides a method to identify and prioritize each hazard for correction. Hazards can then be eliminated on a worst case first basis.

The risk assessment matrix depicted in FM 100-14 is designed for military and tactical operations. Therefore, this matrix would be more appropriate for flight activities. So how do unit-generated worksheets correlate with the matrix in FM 100-14? In order to answer this question we need to explore some concepts of risk management integration.

Risk management is most effective when integrated into all aspects of planning and operations. One method to implement controls is during pre-mission briefings. A more effective method is to integrate controls in regulations, technical or field manuals, and SOPs. The use of unit-generated worksheets is one technique to integrate risk assessment in the planning process for routine missions. Cumulatively, the numbers on these worksheets represent a subjective assessment of the overall mission risk level.

Therefore, a typical day, cross-country mission, with already established controls, may yield a lower risk level than other missions. However, a crew with minimal local area experience may generate a higher numerical value for "crew selection" indicating a higher risk level. If used properly, this should bring attention to the increased risk level and cause the approval authority to focus on that area.

In order to reduce these risks, additional controls should be put in place. In this case, perhaps cross-matching experience level is an adequate control. If so, the assessment should be amended as necessary and re-evaluated.

Another method is to use the matrix out of FM 100-14. With this matrix we might initially assess the same routine mission as "moderate" based on the fact that, even though unlikely, a catastrophic event could take place. This could be viewed as the initial risk level before the implementation of controls. What controls could be used to reduce the risk for this

routine mission? You could cross-match crew experience level. You could also provide for:

- Positive radio contact
- Emergency and rescue support
- Current and qualified crewmembers
- Pre-mission planning requirements
- Appropriate life support equipment

There are obviously other measures that could be taken. The point here is that most of these controls are already established and in place, but maybe not all. The controls that are already in place could be viewed as "integrated risk management." The last step in the risk management cycle includes evaluating the effectiveness of controls. This brings you back to the initial step of "identifying hazards." In this case, perhaps crew mix was not considered or addressed. Therefore, that becomes the new hazard for which controls need to be developed.

With all the new controls in place, a re-evaluation of the mission should be accomplished to determine the "residual" risk. Do the new controls affect the probability of an accident? Severity? Both? This requires another subjective response for which you must carefully consider.

The unit-generated worksheet incorporates standard assessments (numerical value) for common hazards and is used to save time and effort. If we have already identified and assessed particular hazards common to routine missions, there may not be a need to formalize the same assessment process each time.

The matrix is used to identify the level of risk associated with the hazards most likely to occur in a particular mission or operation. As risk managers we can use both tools to identify and assess mission related hazards. Obviously, catastrophic events, such as component failure, may still occur. This does not mean, however, that every flight mission is necessarily a "moderate" risk.

Is it possible that lightning could strike my house today? Yes, it is possible, but not likely. Therefore, I will not assess that hazard on a daily basis. Is it possible that a routine day flight could suffer a catastrophic event? Absolutely! More so than the lightning scenario perhaps, but not as likely as a night, tactical mission. The evaluation of the likelihood of a particular event is subjective and must be based on experience, historical data, and any other sources available. If you determine the risk to be "moderate" with all the controls in place, then so be it. Hopefully, you will either identify additional controls to lower the risk, or elevate the risk decision to the appropriate authority.

Historically, we are much better at the first two steps of the risk management process (identify and assess hazards) than we are with the rest (develop controls and make risk decisions, implement controls, and supervise and evaluate). Often, an effort is made to artificially reduce the numerical value of the overall risk level in order to avoid having to elevate approval authority to the appropriate level. When we do this we are denying critical information to the appropriate decision maker. Even "bad news" is important when making informed and critical decisions. Part of the safety professional's responsibility is to provide all information to the commander. Only then do they have the opportunity to make informed decisions.

The flight risk assessment worksheet in and of itself is neither good nor bad, but becomes so by how we use it. If we use it as a tool to help us identify and assess hazards it can be beneficial. If we use it as a "rubber stamp" for mission approval, and think we have accomplished risk management, we are deceiving ourselves. When was the last time you evaluated your unit's Risk Assessment worksheet? Is it accurate? Is it up to date? Does it identify all the recurring hazards?

Risk management is used to enhance mission accomplishment by reducing or eliminating risks. Not all risks can be eliminated, but most can be reduced. Proper risk management ensures that informed decisions are made at the appropriate level. ✈

—CW4 (R) Don Wright, COBRO Contractor, US Army Safety Center, DSN 558-2919 (334) 255-2919, william.wright@safetycenter.army.mill

A view from the cockpit

As pointed out in the February 02 *Flightfax* article *(Is the glass cockpit safer?)*, the Longbow shares challenges with other 'glass cockpit' aircraft. There were no surprises in this article for the Longbow community—that the potential exists for accidents in a tactical scenario. This is because crew attention is continuously diverted into the cockpit for system interaction. This "in cockpit" orientation most often is greater during the most demanding modes of flight (i.e. while NOE maneuvering or hovering in a firing position during tactical scenarios), when the crew's attention should be focused outside for obstacle avoidance or enemy activity. If we do not manage these challenges, they can lead to the acquisition and fielding of cockpit systems that are not suitable for Army helicopter missions and flight profiles.

While the 64D has several enhancements to station keeping (altitude & position hold modes) and flight symbolic (plus audio) cues over the 64A, the drawback is that the CPG must still focus attention into the cockpit to manipulate systems via MPDs (Multi-Purpose Displays). In comparison, during NVS tactical live fire gunnery in a 64A, a crew can essentially complete the entire mission with very few glances into the cockpit for system switchology. This is because once a crewmember is familiar with a typical analog switch location, position combinations, and functions, he/she can interact with that switch by tactile touch/feel; hence there is no need to visually locate, read, and interpret switch position as in a glass cockpit.

Additionally, blind cockpit type scenarios and switchology can be trained and enhanced through repetition drills in the 64A (with its analog cockpit). Unfortunately, in a glass cockpit where an MPD button does numerous functions, the crewmember must always first locate the desired button, read the current mode/function, switch it to the desired function, enable the function, perhaps type/enter new data, then read/verify that the appropriate action was completed, all while visually oriented inside the cockpit.

Bottom line, someone has to be flying the aircraft. If crewmembers are constantly distracted into the cockpit for otherwise simple system interaction, sooner or later the aircraft *will* strike an obstacle. This situation can be called a 'system-level hazard', because it's built into the combination of the man-machine-environment system. Even though some would 'blame' an obstacle-strike accident on pilot error, the system-level perspective suggests that the pilot is the last line of defense against the hazard. The pilot's performance is therefore simply one control to reducing the risk, and the occurrence of an accident simply demonstrates that this procedural-based control cannot be perfect.

The current glass cockpit trend is somewhat analogous to driving your car at night, lights out, while negotiating a residential neighborhood at high speed and typing an E-mail on your laptop at the same time. Oh, and by the way, if you happen to be in an Apache

pilot, close one eye and shoot that bad guy hiding in the bushes several blocks away as well. Not the case you say? Why is the auto accident rate higher for cell phone users than not?

What are the solutions to these challenges? We all recognize that the technology built into the 64D, and other modern aircraft, can be a huge combat multiplier. Taking full advantage of that technology requires that we manage the assets as a total system. Considering the flight crew as an integral part of the system is taught by textbooks - but is easier said than done! A full and complete understanding of the challenges, by all parts of the Aviation community, is an important piece of the solution.

At the local unit level, it is important that operational planners factor these hazards very carefully into their mission risk assessments. Training and standardization pilots must address the full range of controls available to them, including emphasizing items within crew coordination training programs, and perhaps considerations for standardized cockpit management techniques and operating procedures.

From the 'big Army' perspective, enormous hurdles associated with organizational, cultural and resource issues have impeded progress, by channelizing our focus away from the total system, even though that fact may not be evident from our individual 'foxholes'. Bringing the entire Army Aviation Team to the table, with a common mission objective, is the key. The Commanding Generals of the Aviation Center, Aviation & Missile Command, PEO-Aviation, and the U.S. Army Safety Center have begun this process by chartering the Aviation Safety Investment Strategy Team (ASIST). The Army Chief of Staff laid out a goal to reduce aviation losses by 50% over the next ten years. In response, the Aviation GOs chartered ASIST to recommend investments across the POM that would achieve that goal at the least cost. ASIST has developed

a risk-based process to analyze Army Aviation from a total "man-machine-environment" viewpoint.

This process has brought IPs, SIPs, MTPs, IFEs and other operators face to face with materiel PMs, systems engineers, airworthiness authorities, bio-medical specialists and accident investigators. The result was a profound magnification of the Army's ability to manage the hazards associated with glass cockpits, and other system-level hazards, through improved communications and an understanding of the system-level issues. During the work group sessions, comments were commonly heard such as a systems engineer saying, "I didn't know you trained that way!", and from SIP's, "I had no idea the aircraft was designed that way!" As the results get reported back to the Army's senior leaders, it won't not be surprising to hear comments such as; "We didn't know that investment should be a priority for the POM!"

The improved communications and understanding gained through ASIST should expedite fielding of M/TADS, M/PNVS and other critical safety-related features, while at the same time providing insights back to the operational community of the full scope of the fielding challenges.

As a member of the Apache ASIST team, I am hopeful that this process will be continued for Comanche and other future systems. This systems perspective will be critical to prevent fielding another over-weight, under-powered Army airframe while expecting gun crews to salvage accidents waiting to happen on every mission.

These observations are my own and do not necessarily reflect the opinions of the United States Army or the Aviation Center. I offer these perspectives in the spirit of increasing the dialogue among the operational, training and materiel communities, to assist in setting pilots up for success by focusing on the total system. What is the view from your cockpit? ✈

> A full and complete understanding of the challenges, by all parts of the aviation community, is an important piece of the solution

—Greg Turberville, CW4, USA, Aviation Training Brigade Standards AH-64A/D, United States Army Aviation Center, Fort Rucker AL.

The 7 habits of highly effective aviators

Recent issues of *Flightfax* documented more fatal breakdowns in crew coordination. There are no new accidents. Over and over we stress the lesson "Recurring crew coordination training will reinforce the need for thorough communications among the crew."

An enhanced, computer-based Aircrew Coordination Training program is currently being field-tested and it is our hope that it will soon be available Army-wide. In the interim, we at the Army Research Institute (ARI) feel it would be helpful to put out this reminder.

Stephen Covey's *7 Habits of Highly Effective People* were developed for the business environment but can be applied directly to the cockpit. When we practice these principles in the conduct of our daily training and operations, so that they become habitual, we coincidentally apply the Risk Management (RM) process. Simultaneously the Crew Coordination Objectives of Aircrew Coordination Training (ACT) are achieved, which enhances greater safety and effectiveness as aircrew members and leaders.

***Habit 1:* Be Proactive.** *Highly effective people take the initiative to improve their own situation proactively. Their behavior is a product of conscious choice, rather than a product of their conditions.*

The first step in the RM process directs us to identify hazards and potential threats, prior to their occurrence, so that we can effectively anticipate situations and coordinate appropriate responses. Proactive pre-mission planning challenges crewmembers to think through contingencies and actions for difficult segments, tasks, or unusual events associated with the mission, and to develop strategies for coping with those contingencies. In the case of a recent AH-64 mishap, the Instructor Pilot (IP) and the Pilot (PI) might have discussed how their workloads would be re-distributed in the event that they were required to move into a different gun position. In-flight re-planning involves taking advantage of low workload periods to review and rehearse upcoming segments and to identify any required adjustments, to ensire that planning consistently stays ahead of critical lead times.

***Habit 2:* Begin with the End in Mind.** *Highly effective people understand where they want to go before they start, and then commit to a plan to get there.*

For businesses, a mission statement that reflects a shared vision creates unity and commitment. In aviation, effective pre-mission planning accomplishes this goal by creating a shared mental model among crewmembers. Each must understand the mission requirements and his or her role in accomplishing the mission. This understanding is reinforced by mentally rehearsing the entire mission, and by visualizing and discussing potential problems, contingencies, and responsibilities. The effective leader ensures that each crewmember is actively involved in the mission planning process, able to adopt a common understanding of mission intent and operational sequences.

***Habit 3)* Put First Things First.** *Highly effective people establish priorities and honor them on a moment-by-moment basis.*

Effective crewmembers are consistently able to identify and prioritize competing mission tasks. They attend to flight safety and other high-priority tasks while delaying low-priority tasks until they will have no impact on performance or safety. They avoid distractions from essential activities and maintain their focus by distributing workload, especially during critical phases of flight. An AH-64 mishap resulted when the PI tuned the radio while the IP focused on the Target Acquisition Designation System. "The primary concern of the pilot on the controls is flying the aircraft."

***Habit 4:* Think Win/Win.** *Highly effective people seek solutions in which all parties feel positively about the decision and are*

committed to the action plan.

Aircrews are teams with a designated leader and clear lines of responsibility, but effective leaders do not operate without the participation of other crewmembers and a healthy respect for their competencies. When crewmembers disagree on a course of action, the effective leader recognizes that the input of the entire crew provides a greater range of decision options than those generated by the individual alone. On average, decisions that consider crew recommendations will be better than decisions made by the pilot alone.

Habit 5: Seek First to Understand... Then to be Understood. *Highly effective people learn to be good listeners. They make an effort to understand a problem before rushing to fix it, diagnosing before they prescribe, and then present their ideas clearly and specifically.*

In an AH-64 mishap, the PI assumed that a request to tune the radio implied a transfer of controls. Research has found that aircrews receiving high performance ratings consistently practice good listening skills. They attend to the sender of communications, ask questions when they're unsure of the message, restate the message if necessary, and acknowledge the message both verbally and through their actions. Then, as the sender, they use standardized terminology and concise brevity while delivering statements and directives in a timely manner, seeking feedback from other crewmembers.

Habit 6: Synergize. *Highly effective people work with the individual strengths that team members bring with them, so that the resulting team is stronger than the individual members. A leader who practices synergy learns to orchestrate individual members into a symphony of effective results.*

Effective aircrews are composed of assertive crewmembers that consistently engage in situational leadership, helping each other without request. They participate as a team in the planning, execution, and after-action review phases of missions. Every crewmember is responsible for actively contributing to the team effort, by monitoring changes in the situation and being assertive when necessary, while maintaining an attitude of professionalism. Some key leadership principles from FM 22-100, Military Leadership, are: "keep your subordinates informed", "build the team", and "employ your unit in accordance with its capabilities".

Habit 7: Sharpen the Saw. *Highly effective people renew themselves on a regular basis. They realize that to deny the need for preserving and enhancing their skills is to become stale, destructive, and ineffective.*

In recent years, a lowering of experience levels and atrophy of skills related to reduced flying hours, in concert with the development of new cockpit technologies, have led to a Congressional recognition of the need for a revitalized crew coordination training program in Army aviation. The Army Research Institute, Rotary Wing Aviation Research Unit at Fort Rucker, with Dynamics Research Corporation, has developed an enhanced Aircrew Coordination Training Program to revitalize Army Aviation's ACT skills. The new web-based ACT program has been positively received as realistic and relevant, improving mission effectiveness and safety, as reflected in feedback from unit leaders, instructor pilots, and crewmembers completing field testing. Effective aviators continually "sharpen the saw." Accordingly, the enhanced ACT program builds on the original exportable training package, enhancing it to a dynamic, relevant program that is continuously updated and improved.

Stephen Covey's *The 7 Habits of Highly Effective People* advanced the position that effective people develop habits that influence the direction and choices of their lives. These same principles can enhance our ability to establish and maintain safety and effectiveness in the cockpit. As recent mishaps remind us, understanding crew coordination skills is important, but practicing them in our daily operations, at every level of leadership, is critical. ◄█

—Dr. Larry Katz, Research Psychologist, Army Research Institute Rotary Wing Aviation Research Unit, Fort Rucker, AL 36362, DSN 558-2385, katzl@rwaru.army.mil

It is impossible to accurately measure the results of aviation safety.

No one can count the fires that never started, the aborted takeoffs that do not occur, the engine failures and the forced landings that never take place.

And one can neither evaluate the lives that are not lost, nor plumb the depths of human misery we have been spared.

But the individuals with the flight controls, fueling hoses, tools, radar, or clipboards can find lasting satisfaction in the knowledge they have worked wisely and well, and that safety has been their first consideration.

(author unknown—adapted
from *Flightfax*, May 1995)